

Occupational risks for male breast cancer in Sweden

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The aetiology of male breast cancer is obscure, although the role of endogenous oestrogens has been suggested by excess risks reported with Klinefelter's syndrome, orchitis or orchiectomy, gynaecomastia, and familial occurrences.^{1,2} Oestrogen and radiation treatment have played a part in some cases.^{3,4} Except for a reported excess of patients employed in blast furnaces, steel works, and rolling mills, little is known about occupational factors in male breast cancer.¹ In an attempt to provide further leads to occupational factors, we have used the Cancer-Environment Registry of Sweden to assess systematically the incidence of this rare cancer by occupational and industrial categories for an entire nation.

Methods

A description of the Cancer Environment Registry and the statistical methods used in calculating the standardised incidence ratio (SIR), a ratio of observed to expected cancers occurring from 1961 to 1979 among men in occupational groups defined by employment in 1960, have been published earlier in this journal.⁵ For specific (three-digit) employment categories, only those with three or more observed cases of breast cancer were examined.

Accepted 6 July 1987

Results

From 1961 to 1979 333 cases of breast cancer occurred among Swedish men who had been employed in 1960. Ninety nine per cent were microscopically confirmed, with 97% classified as adenocarcinomas. Table 1 shows those industries and occupations with a significantly ($p < 0.05$) increased incidence of male breast cancer. The highest risk ($SIR = 7.6$) was observed for men employed in making soap and perfume. A significant fourfold increase in risk was found for men engaged in newspaper printing. Sixfold or greater risks were seen for the occupations of mental hospital attendants and journalists and editors. Employment in retail hardware, real estate, health care, government administration, and as a secretary was also associated with a significantly raised risk of male breast cancer. Table 2 provides further information on industries and occupations with 70% or greater excess risk. SIRs of 2.5 to 3 were observed for gardeners, pig iron and steel making, breweries, and other agricultural activities.

Discussion

This hypothesis generating study has identified several occupational associations with male breast cancer. Perhaps most interesting is the almost eightfold risk

Table 1 Statistically significant ($p < 0.05$) standardised incidence ratios (SIR) for male breast cancer by specific (three digit) industries and occupations in Sweden, 1961-79

Industry				Occupation			
Code	Title	Cases	SIR†	Code	Title	Cases	SIR†
270	Newspaper printing	7	3.9*	042	Mental hospital attendants	3	6.6
316	Soap and perfume making	3	7.6	085	Journalists and editors	5	6.2*
642	Retail hardware	4	4.2	299	Secretaries, nec	5	4.1
680	Real estate	6	2.8				
807	Government administration, nec	5	3.2				
820	Health care	9	2.4				

* $p < 0.01$. †Adjusted for age and region.
nec = Not elsewhere classified.

Table 2 Raised standardised incidence ratios ($SIR \leq 1.7$) for male breast cancer by specific (three digit) industries and occupations in Sweden, 1961-79

Industry				Occupation			
Code	Title	Cases	SIR*	Code	Title	Cases	SIR*
016	Other agricultural activities	5	2.8	003	Mechanical engineers	12	1.7
211	Breweries	3	2.8	053	Teachers	3	1.9
233	Garment making	3	2.0	118	Business administrators	8	2.1
241	Construction carpentry	4	1.7	412	Gardeners	6	2.5
334	Cement plants	3	1.8	801	Typographers	6	2.3
341	Pig iron and steel	3	2.6	931	Caretakers	7	1.8

*Adjusted for age and region.

for soap and perfume manufacturing, since this industry during the 1950s and early 1960s made oestrogen containing cosmetic creams (A Gillners, personal communication). Feminising effects, including gynaecomastia, have been noted among workers formulating oestrogen containing pharmaceuticals,⁶ but male breast cancer has not been reported to our knowledge in these groups. In the soap and perfume industry workers are also exposed to a wide variety of solvents and chemical reagents, especially aromatic and halogenated hydrocarbons.^{7,8} Although breast cancer was too rare for evaluation in a recent mortality study of men in the perfume making industry in Geneva,⁷ there was no significant excess for any reported cancer site.

The significantly high incidence of male breast cancer in the newspaper printing industry is noteworthy, since these workers are in contact with many compounds including pigments, dyes, resins, oils, and solvents. It is not known whether similar exposures occurred among journalists and editors, also at high risk of male breast cancer. The 2.4-fold risk for employees in the health care industry mainly reflects raised rates for mental hospital attendants in the industry, although the responsible factors are unknown. The increased incidence observed for pig iron and steel manufacturing is consistent with a recent case-control study that reported a significant risk associated with employment in blast furnaces, steel works, and rolling mills.¹ The authors suggested that this association may be mediated by hormonal factors secondary to testicular injury in high temperature occupations.

The limitations of the CER database⁵ preclude drawing aetiological inferences about the associations

observed in this survey. Because of the many comparisons made and the few cases in most industrial and occupational groups, even a few cases of such a rare tumour could result in a relatively high or statistically significant SIR. Nevertheless, the method used in this study has uncovered known occupational determinants for other cancers, thereby increasing confidence in the sensitivity of this approach. Although it is unclear whether our findings point to actual occupational hazards, the systematically obtained data may be useful as a reference point for future investigations into the causes of male breast cancer.

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